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(56) Documents cited  
 WO 86/01100 A1

(58) Field of search  
 UK CL (Edition J) A4N  
 INT CL<sup>4</sup> E03C

(54) Whirlpool/spa bath drainage valve

(57) A drainage valve 11 for a whirlpool bath or air spa bath comprises an open-ended chamber 12 located below the waste aperture 2 of the bath the chamber being provided with an aperture 26 through which liquid 34 from associated pipework may drain, and a pop-up valve member 17-21 comprising an upper element 18 which seats on seat 13 and a lower element 20 provided with seal 21 which seals against surface 15. The upper element may be solid or apertured. The arrangement is such that both bath and associated pipework may be drained of liquid simultaneously.

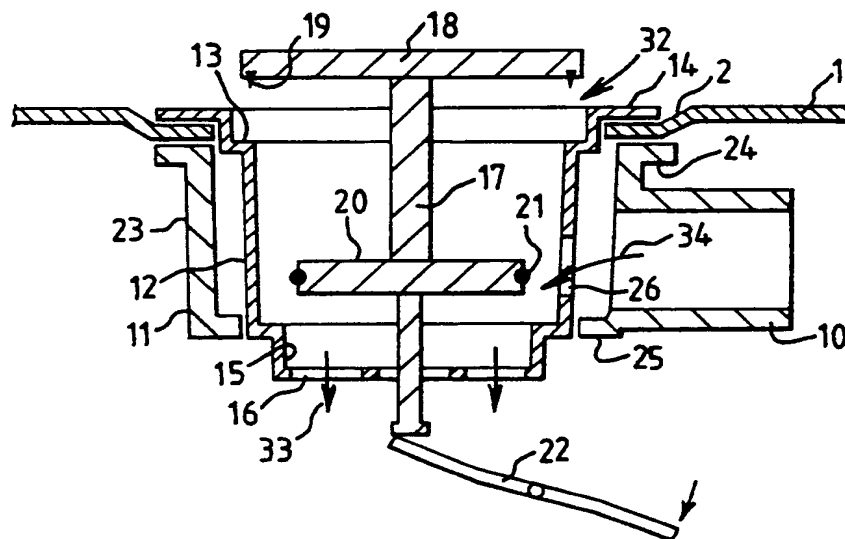


FIG. 8.

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

The claims were filed later than the filing date within the period prescribed by Rule 25(1) of the Patents Rules 1982.

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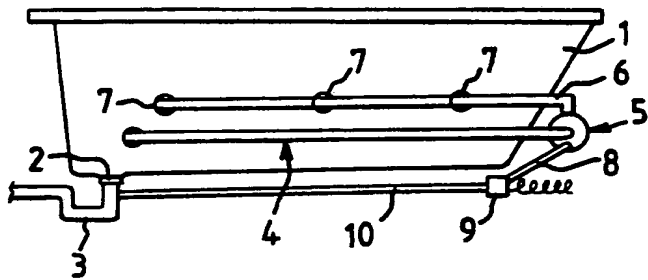


FIG. 1.

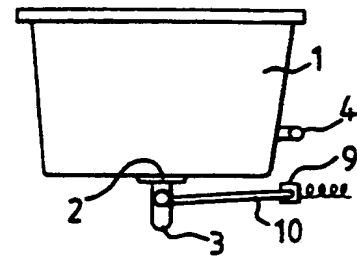


FIG. 2.

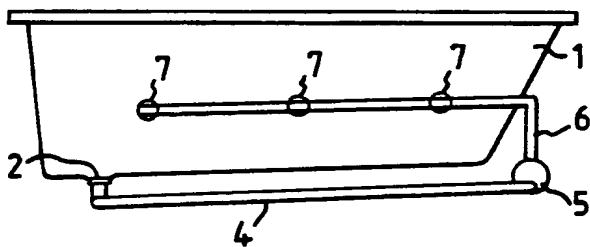


FIG. 3.

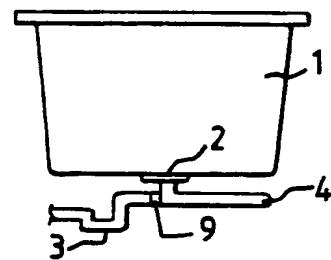


FIG. 4.

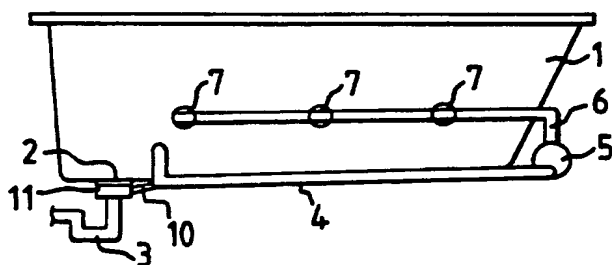


FIG. 5.

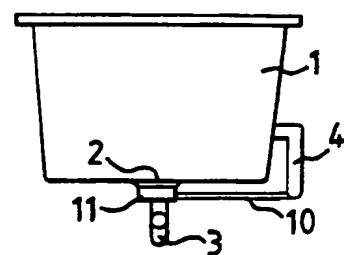


FIG. 6.

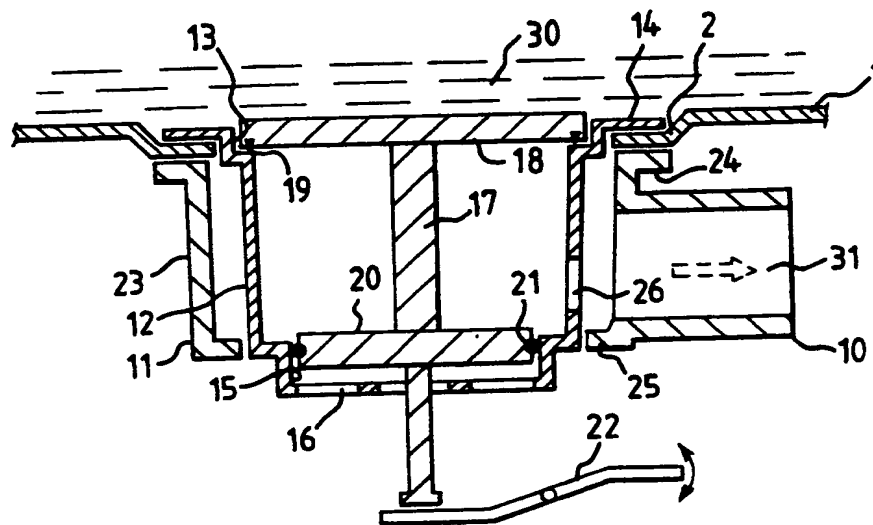


FIG. 7.

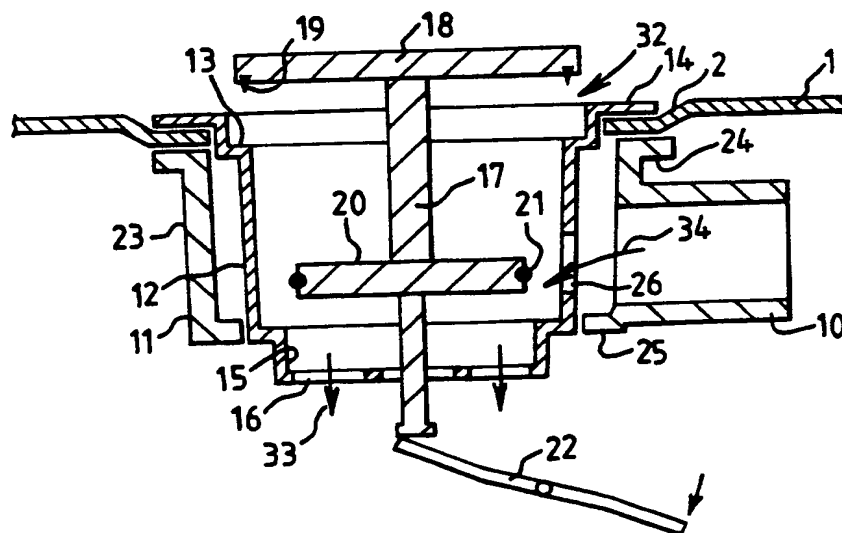


FIG. 8.

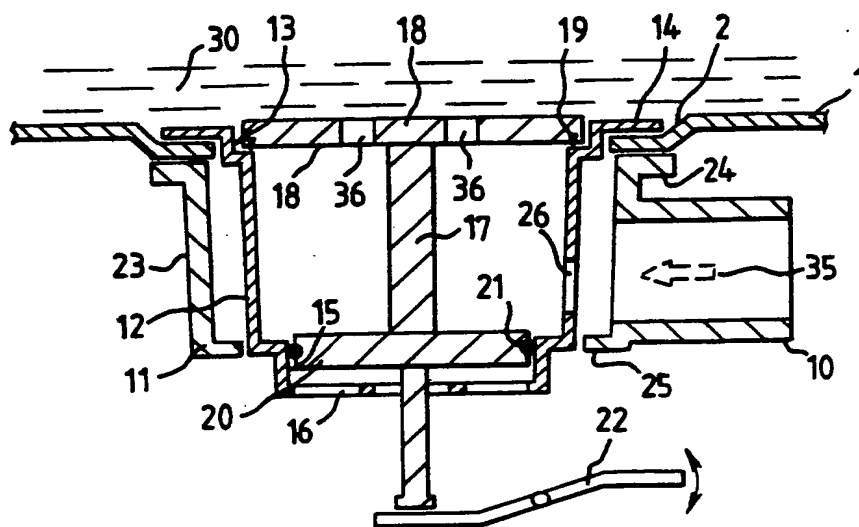


FIG. 9.

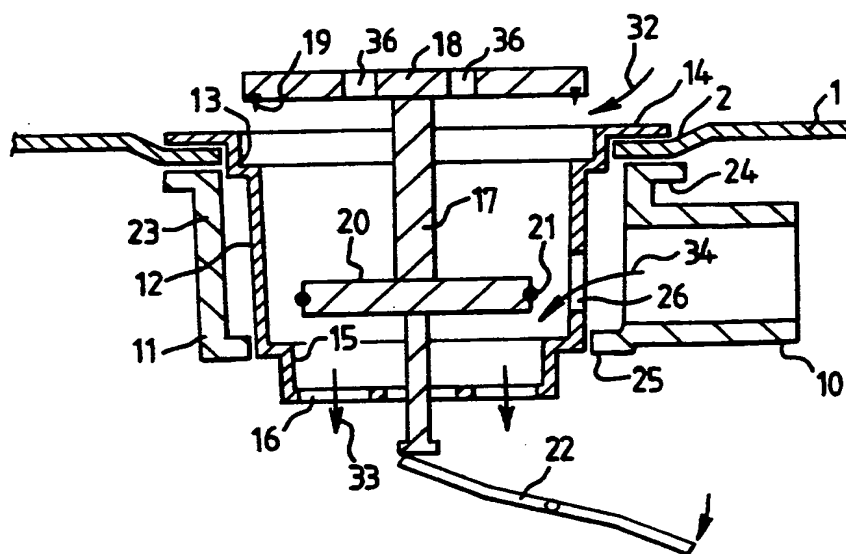


FIG. 10.

Improvements in or relating to Baths, particularly  
Whirlpool and Spa Baths.

This invention relates to baths, particularly to whirlpool and spa baths.

5 In whirlpool and spa baths it is presently preferred, and is likely to become standard practice, to drain all the associated pipework, when the bath is emptied.

Known methods to provide for such drainage may involve the use of electric solenoid-operated valves and  
10 unduly increase the cost and complexity of such bath installations.

The present invention provides a simple and inexpensive bath drainage valve arrangement as an alternative to the known drainage arrangements. The  
15 invention thus provides a mechanically-operated bath waste drainage valve for fitting in the waste aperture of a bath, having an upper closure member, for closing or venting the waste aperture, a lower chamber, for receiving drainage from associated pipework and a lower  
20 closure member, for closing or venting the chamber simultaneously with the operation of the upper closure member.

The upper closure member may be solid or may be apertured, depending upon its intended use for a whirlpool  
25 bath or for an air spa bath, respectively.

Short Description of the Drawings

Examples of known pipework drainage arrangements and one embodiment of the present invention for use with a whirlpool bath system, together with a variant thereof  
30 for use with an air spa bath system, will now be described, by way of example, with reference to the accompanying drawings, of which:

Figs. 1-4 illustrate known drainage arrangements;

Fig. 1 is a side elevation view of a whirlpool bath;

Fig. 2 is a side elevation view of the bath of Fig. 1;

Fig. 3 is a side elevation view of an alternative whirlpool bath; and

5 Fig. 4 is an end elevation view of the bath of Fig. 3;

Figs. 5-10 illustrate arrangements according to the present invention;

Fig. 5 is a side elevation view of a whirlpool bath;

10 Fig. 6 is an end elevation view of the bath of Fig. 5;

Fig. 7 is an unusual cross-section view of a drainage valve of the invention, for use with a whirlpool bath, in its closed position;

15 Fig. 8 is a corresponding view of the drainage valve of Fig. 7, in its open position;

Fig. 9 is an axial cross-section view of a variant of the drainage valve of Fig. 7, for use with an air spa bath, in its closed position; and

20 Fig. 10 is a corresponding view of the drainage valve of Fig. 9, in its open position.

The same or corresponding parts are indicated by the same reference numerals throughout the several drawings.

#### Description of the Embodiments

25 Figs. 1 and 2 show a whirlpool bath arrangement having a bath tub 1 with a waste apperture 2 and waste trap 3. The arrangement further has a suction pipe 4, for drawing water from the bath tub 1, a pump 5 supplying a pressure pipe 6 and a series of whirlpool jets 7. In  
30 order to drain the pump 5 and pipes 4 and 6, a drainage pipe 8, solenoid-operated valve 9 and drainage pipe 10 connected to the bath waste pipework are further provided.

Figs. 3 and 4 show a different whirlpool bath arrangement, in which the suction pipe 4 is connected  
35 below the bath waste 2. This arrangement requires an

additional valve 9 between the bath waste aperture 2 and the waste trap 3.

Figs. 5 and 6 show a whirlpool bath arrangement according to the invention having a bath tub 1 with waste  
5 aperture 2 and waste trap 3. A pump 5 draws water from the bath, near to the bottom, by way of a suction pipe 4 and feeds it to a series of whirlpool jets 7 by way of a pressure pipe 6. The suction pipe 4 is taken to below the base level of the bath tub 1 and, from the lowest  
10 part of the pipe 4, a drainage pipe 10 is taken to a double drainage valve 11 fitted in the waste aperture 2 of the bath tube 1. The valve 11 is of the form shown in Figs. 7 and 8.

Fig. 7 shows the double drainage valve 11 in detail.  
15 The valve 11 comprises a chamber part 12 formed with an upper valve seat 13 and flange 14, by which the valve 11 fits below the waste aperture 2 of the bath tub 1. The lower part of the chamber 12 provides a lower valve seat 15 and a waste exit grid 16. A central stem 17 carries  
20 an upper valve 18, having a peripheral seal member 19, which seals against the valve seat 13. Below the valve 18 is a lower valve 20, having a peripheral seal member 21, which seals against the valve seat 15.

The stem 17 and valves 18, 20 form a pop-up valve  
25 assembly positioned by bearing surfaces, not shown, and moved upwardly by a pivoted arm 22 or downwardly by its own weight.

Surrounding the chamber part 12 is a casing 23.  
This casing 23 has an upper outwardly-turned flange 24,  
30 by which it is sealed to the underside of the bath waste aperture 2, and a lower inwardly-turned flange 25, by which it is sealed to the chamber part 12. The drainage pipe 10, Figs. 5 and 6, fits into the side of the casing 23 and an aperture 26 in the side of the chamber part 12  
35 provides communication with the inner chamber thereof.

When the drainage valve 11 is closed, as shown in Fig. 7, the bath tub 1 may be filled with water, as indicated at 30. When the pump 5, Figs. 5 and 6, is operated, a negative pressure is created in the suction pipe 4 and hence in the drainage pipe 10, as represented by the broken-line arrow 31, Fig. 7. This same negative pressure is created in the inner chamber of the chamber part 12 and hence acts on the underside of upper valve 18 and on the top of lower valve 20. The upper valve is 5  
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make of greater surface area than the lower valve 20, so that the resultant force on the valve assembly, due to the internal negative pressure, is in the direction to close the valve.

When the pump 5 is stopped and the valve stem 17 is lifted, by tilting of the pivoted arm 22, both valves 18 and 20 are lifted from their respective valve seats 13 and 15 and the drainage valve 11 is opened, as is shown in Fig. 8. Waste water from the bath tub 1 flows out, as shown by the arrows 32 and 33, to the waste trap 3 and drain. Dead water in the pressure pipe 6, pump 5 body, suction pipe 4 and drainage pipe 10, similarly drains away, as shown by the arrow 34, Fig. 8.

Figs. 9 and 10 show a very similar double drainage valve 11, used for an air spa bath. In a spa bath system, air is forced into the water contained in the bath tub and the associated pipework is under positive pressure, as is indicated by the arrow 35, Fig. 9. In this form of valve 11, the upper valve 18 is apertured, as shown at 36, sufficiently to reduce the surface area of valve 18 to less than that of valve 20. Under positive pressure, the resultant force on the stem 17, valve 18 and 20 assembly is again downwardly, in the direction of valve closure.

In the use of the spa bath, air is forced upwardly through the apertures 36 by reason of the air pressure in



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the pipework. When the air jets are stopped, that part of the pipework below the level of water in the bath tub will flood. When the double drainage valve 11 is opened, as shown in Fig. 10, both the bath tub and associated  
5 pipework will drain, in the manner described with reference to Fig. 8.

CLAIMS

1. A bath waste drainage valve, for fitting in the waste aperture of a bath, having an upper closure member, for closing or venting the waste aperture, a  
5 lower chamber, for receiving drainage from associated pipework, and a lower closure member, for closing or venting the chamber simultaneously with the operation of the upper closure member.
2. A bath waste drainage valve as claimed in  
10 Claim 1, in which the upper and lower closure members are carried by a common stem and form a unitary pop-up valve assembly.
3. A bath waste drainage valve as claimed in Claim 2, which is mechanically operated by lifting means  
15 positioned below the said chamber.
4. A bath waste drainage valve as claimed in Claim 1, for a whirlpool bath, having the upper closure member of greater surface area than the lower closure member.
- 20 5. A bath waste drainage valve as claimed in Claim 1, for a spa bath, having the upper closure member of less surface area than the lower closure member.
6. A bath waste drainage valve as claimed in Claim 5, in which the upper closure member is apertured.
- 25 7. A bath waste drainage valve as claimed in Claim 1, constructed substantially as described herein with refer nce to Figures 7 and 8 of the accompanying

drawings.

8. A bath waste drainage valve as claimed in Claim 1, constructed substantially as described herein with reference to Figures 9 and 10 of the accompanying  
5 drawings.

9. A bath, including a bath waste drainage valve as claimed in Claim 1.

10. A whirlpool bath, including water-jet associated pipework and a bath waste drainage valve as  
10 claimed in Claim 4.

11. A spa bath, including air-jet associated pipework and a bath waste drainage valve as claimed in Claim 5 or Claim 6.